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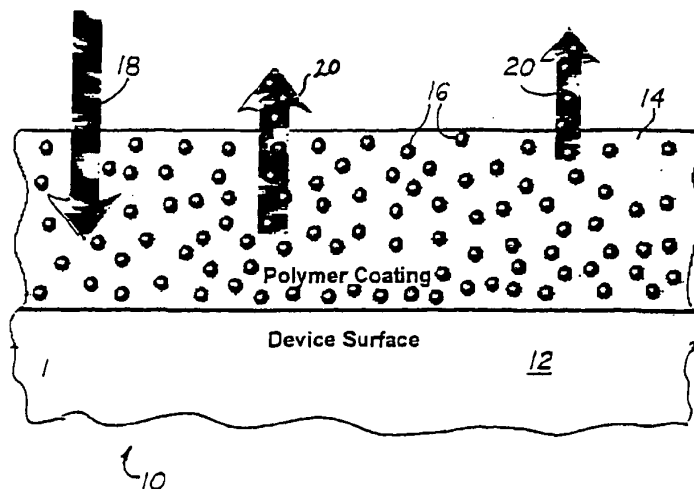
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- Declarations under Rule 4.17:**
— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations
— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

[Continued on next page]

(54) Title: TARGETED THERAPEUTIC AGENT RELEASE DEVICES AND METHODS OF MAKING AND USING THE SAME



(57) Abstract: Generally, the present invention provides devices and methods for delivering high, efficacious concentrations of therapeutic agents, i.e., medicaments such as drugs, antibiotics, etc., to specific sites in a patient's body, such as tumors and infected lesions. In one aspect of the present invention there are provided devices to accomplish the aforesaid delivery of therapeutic agents and methods to accomplish the delivery by positioning a device in the body using minimally invasive techniques such as, for example, catheterization or via trochar. The devices may contain a carrier substrate and a coating on the substrate. The carrier substrate provides structural integrity to the device and the coating thereon contains at least one layer of polymeric material containing one or more medicaments. Optionally, there may be a non-medicated binder coat between the carrier substrate and the medicated polymer layer. The medicated polymer layer may contain a hydrophilic/hydrophobic polymer composition. See Figure 1.

WO 01/78626 A1

THE CLAIMS

What is claimed is:

- 5 1. A medicated device comprising:
 a scaffold member suitable for implantation at a tumor or other lesion site;
 a polymeric coating ("med coat") on the scaffold member; and
 at least one therapeutic agent in the med coat at a loading sufficient to provide
----- therapeutic quantities of the therapeutic agent to the site for an extended period of time. -----
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2. The device of claim 1 comprising an anti-cancer therapeutic agent in the med coat.
3. The device of claim 1 comprising at least 5 micrograms (μg) of at least one therapeutic agent per square centimeter of the med coat.
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4. The device of claim 3 comprising at least 50 μg of at least one therapeutic agent per square centimeter of the med coat.
5. The device of claim 4 comprising at least 100 μg of at least one therapeutic agent
20 per square centimeter of the med coat.
6. The device of claim 5 comprising at least 500 μg of at least one therapeutic agent per square centimeter of the med coat.
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7. The device of claim 1 comprising sufficient quantity of a therapeutic agent to deliver therapeutically effective quantity of a therapeutic agent into tissue in a region of at least one centimeter from the device.
8. The device of claim 7 comprising sufficient quantity of a therapeutic agent to deliver therapeutically effective quantity of a therapeutic agent into tissue in a region of at least
30 two centimeters from the device.

9. The device of any one of claims 1-5 wherein the med coat comprises a hybrid polymeric coating comprising a hydrophilic polymer component and a hydrophobic polymer component.

5 10. The device of claim 9 wherein the hydrophobic polymer component comprises one or more cellulose ester polymers.

11. The device of claim 1 wherein the polymeric coating comprises an acrylate polymer and PVP/VA copolymer in a weight ratio in the range of from 1.5:1 to 7:1.

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12. A medicated device comprising:
a substrate suitable for implantation in a patient's body;
a polymeric coating ("med coat") on the scaffold member; and
at least one therapeutic agent in the med coat at a loading sufficient to provide
15 therapeutic quantities of the therapeutic agent to the patient's tissue in a region in the body extending at least one centimeter from the device.

13. The device of claim 12 comprising sufficient quantity of a therapeutic agent to deliver therapeutically effective quantity of a therapeutic agent into tissue in a region of at least
20 two centimeters from the device.

14. The device of claim 12 or claim 13 comprising a hybrid polymeric coating comprising a major proportion of one or more hydrophilic polymer materials and a minor proportion of one or more cellulose ester polymers.

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15. The device of claim 14 wherein the cellulose ester polymer comprises about 3% by weight of the combined weights of the cellulose ester polymer and the hydrophilic polymer materials.

30 16. The device of claim 14 wherein the cellulose ester polymer comprises nitrocellulose.

17. The device of claim 16 wherein the nitrocellulose comprises about 3% by weight of the combined weights of nitrocellulose and the hydrophilic polymer materials.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/12159

A. CLASSIFICATION OF SUBJECT MATTER												
IPC(7) : A61F 2/02 US CL : 424/423												
According to International Patent Classification (IPC) or to both national classification and IPC												
B. FIELDS SEARCHED												
Minimum documentation searched (classification system followed by classification symbols) U.S. : Please See Continuation Sheet												
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched												
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) MEDLINE, EMBASE, SCISEARCH, BIOSIS, CAPLUS												
C. DOCUMENTS CONSIDERED TO BE RELEVANT												
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.										
X,P	US 6,110,483 A (WHITBOURNE et al.) 29 August 2000 (29.08.2000), see entire document.	1-17										
X	US 5,840,329 A (BAI) 24 November 1998 (24.11.1998), see entire document.	1-2, 9-11										
Y		3-8, 12-17										
X,P	US 6,231,888 B1 (LERNER et al.) 15 MAY 2001 (05.15.2001), see entire document.	1-2, 9-11										
Y,P		3-8, 12-17										
X	US 6,001,386 A (ASHTON et al.) 14 December 1999 (14.12.1999), see entire document.	1-2, 9-11										
Y		3-8, 12-17										
X	US 5,294,448 A (RING et al.) 15 March 1994 (15.03.1994), see entire document.	1-2, 9-11										
Y		3-8, 12-17										
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.												
* Special categories of cited documents: <table border="0"> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"E" earlier application or patent published on or after the international filing date</td> <td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td>"&" document member of the same patent family</td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed	
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Form PCT/ISA/210 (second sheet) (July 1998)

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/12159

Continuation of B. FIELDS SEARCHED Item 1:

424/423, 94.64, 78.24, 78.27, 423, 457, 458, 461, 462, 463, 468, 469, 494, 497; 514/772.1, 772.2, 772.3, 777, 778, 779, 781, 782, 783, 786, 834, 781; 623/1, 3; 604/187, 313, 319; 427/2.3, 569